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IS : 12085 - 1987

Indian Standard

SPECIFICATION FOR CYCLOHEXYLAMINE FOR BOILER WATER TREATMENT

"पुनर्पुष्ट १९९२"
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Gr 2

December 1987

AMENDMENT NO. 1 SEPTEMBER 1990
TO
IS 12085:1987 SPECIFICATION FOR CYCLOHEXYLAMINE FOR BOILER WATER TREATMENT

(Page 4, clause 4.1) - Substitute the following for the existing clause:

'4.1 Packing - The material shall be packed in lined MS drums or any other suitable containers which should not react with cyclohexylamine or as agreed to between the purchaser and the supplier.'

(CHD 13)

Reprography Unit, BIS, New Delhi, India

IS : 12085 - 1987

Indian Standard

SPECIFICATION FOR CYCLOHEXYLAMINE FOR BOILER WATER TREATMENT

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(*Continued on page* 2)

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(*Continued on page* 8)

Indian Standard

SPECIFICATION FOR CYCLOHEXYLAMINE FOR BOILER WATER TREATMENT

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 1 January 1987, after the draft finalized by the Boiler Water Sectional Committee had been approved by the Chemical Division Council.

0.2 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for cyclohexylamine.

2. TERMINOLOGY

2.1 For the purpose of this standard, definitions given in IS : 11671-1985† shall apply.

3. REQUIREMENTS

3.1 The material shall be clear and free from matter in suspension and shall consist essentially of cyclohexylamine, $C_6H_{11}NH_2$.

3.2 The material shall comply with the requirements prescribed in Table 1.

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*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to boiler waters.

TABLE 1 REQUIREMENTS FOR CYCLOHEXYLAMINE FOR BOILER WATER TREATMENT

(*Clause* 3.2)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO
(1)	(2)	(3)	(4)
i)	Purity, percent by mass, *Min*	99·2	Appendix A
ii)	Relative density, 20°/20°C	0·860 to 0·870	IS : 3025 (Part 12)-1983*
iii)	Colour, Hazen unit, *Max*	10	IS : 3025 (Part 4)-1985*
iv)	Boiling range, *Min*	95 percent by volume between 130°C and 135°C	IS : 5298-1984†
v)	Residue on evaporation, percent by mass, *Max*	0·01	**10** of IS : 3025-1964‡
vi)	Ash content, g/100 ml, *Max*	0·003	**11** of IS : 3025-1964‡
vii)	Iron (as Fe), ppm, *Max*	5	**32** of IS : 3025-1964‡
viii)	Copper (as Cu), ppm, *Max*	5	**36** of IS : 3025-1964‡
ix)	Nickel (as Ni), ppm, *Max*	5	**14** of IS : 2488 (Part 1)-1968§
x)	Silica (as SiO_2), ppm, *Max*	5	**30** of IS : 3025-1964‡
xi)	Chloride (as Cl), ppm, *Max*	5	**24** of IS : 3025-1964‡
xii)	Miscibility with water	No opalescence when one volume is mixed at 15°C with 10 volumes of water	

*Methods of sampling and test (physical and chemical) for water and waste water:
Part 12 Density (*first revision*).
Part 4 Colour (*first revision*).

†Methods for determination of distillation range and of distillation yield (*first revision*).

‡Methods of sampling test (physical and chemical) for water used in industry.

§Methods of sampling and test for industrial effluents, Part 1.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed in suitable polyethylene lined containers as agreed to between the purchaser and the supplier.

4.2 Marking — The containers shall be marked with the following:

a) Name of the material;

b) Name of the manufacturer or his recognized trade-mark, if any;

c) Net mass or volume;

d) Batch number;

e) Cautionary note as given below:

CYCLOHEXYLAMINE IS CAUSTIC AND CONTACT WITH SKIN SHOULD BE AVOIDED. EYE PROTECTOR SHOULD ALWAYS BE WORN WHEN THE MATERIAL IS BEING HANDLED.

4.2.1 The containers may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

5. SAMPLING

5.1 General Requirements of Sampling

5.1.0 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

5.1.1 Samples shall not be taken in an exposed place.

5.1.2 The sampling instruments shall be clean and dry.

5.1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instruments and the containers for samples from adventitious contamination. To draw a representative sample from a container, the material shall be mixed thoroughly by suitable means before sampling.

5.1.4 The sample shall be placed in clean and air-tight glass bottles or other suitable containers on which the material has no action and which have been washed several times with the material to be sampled.

5.1.5 The sample containers shall be of such a size that they are filled by the sample leaving an ullage of not more than five percent.

5.1.6 Each sample container shall be sealed air-tight after filling, and marked with full details of sampling, the date of sampling and the year of manufacture of the material.

5.2 Scale of Sampling

5.2.1 *Lot* — All containers in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

5.2.2 For ascertaining conformity of the material in a lot to the requirements of this specification, samples shall be tested for each lot separately. The number of containers to be selected at random from lots of different sizes shall be in accordance with Table 2.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

Lot Size N (1)	Sample Size n (2)
3 to 15	3
16 to 40	4
41 to 65	5
66 to 110	7
111 and above	10

5.2.2.1 In order to ensure randomness of selection, the following procedure shall be adopted:

> 'Arrange all the containers in the lot in a systematic manner and starting from any one, count them as 1, 2, 3 ..... up to r, where r is the integral part of N/n (N and n being the lot size and sample size respectively). Every rth container thus counted shall be withdrawn to constitute the test sample.

6. TESTS

6.1 Tests shall be carried out as prescribed in col 4 of Table 1.

6.2 Quality of Reagents — Unless otherwise specified, reagent grade chemical and distilled water (*see* IS : 1070-1977*) shall be employed in tests.

NOTE — Reagent grade chemicals shall mean chemicals that do not contain impurities which affect the results of analysis.

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*Specification for water for general laboratory use (*second revision*).

APPENDIX A

[*Table* 1 *Sl No.* (i)]

METHOD FOR DETERMINATION OF PURITY OF CYCLOHEXYLAMINE

A-0. PRINCIPLE

A-0.1 The sample is neutralized with excess hydrochloric acid solution and the excess acid is titrated with standard sodium hydroxide solution.

A-1. REAGENTS

A-1.1 Standard Hydrochloric Acid — 0·5 mol/l solution.

A-1.2 Methyl Red Indicator — *See* IS : 2263-1979*.

A-2. PROCEDURE

A-2.1 Introduce from a pipette 50 ml of 0·5 mol/l hydrochloric acid into 250-ml Erlenmeyer flask. Add a drop of methyl red indicator and from a tared Lunge pipette add 2 g of the sample directly into acid. Reweigh the Lunge pipette and observe the colour of the solution which should be pink or red.

NOTE — A yellow colour solution at this point indicates that the sample size was excessive. In this case repeat the determination with a smaller size sample.

A-2.1.1 Heat the solution to boiling and boil gently for approximatey one minute to remove carbon dioxide. Titrate immediately with 0·5 mol/l sodium hydroxide solution to yellow end point. Calculate the percentage of cyclohexylamine as given in **A-3.**

A-3. CALCULATION

$$\text{Cyclohexylamine, percent by mass} = \frac{9{\cdot}917\,(V_2 - V_1)}{M}$$

where

V_1 = volume in ml of standard sodium hydroxide solution used for titrating excess acid in the flask containing sample;

V_2 = volume in ml of standard sodium hydroxide solution used for titrating 50 ml of acid; and

M = weight in g of the sample taken for test.

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*Methods of preparation of indicator solution (*first revision*).

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